



Examiners' Report Lead Examiner Feedback

January 2022

Pearson BTEC Nationals
In Applied Science (31629H)
Unit 7: Contemporary Issues in Science

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Grade Boundaries

What is a grade boundary?

A grade boundary is where we set the level of achievement required to obtain a certain grade for the externally assessed unit. We set grade boundaries for each grade, at Distinction, Merit and Pass.

Setting grade boundaries

When we set grade boundaries, we look at the performance of every learner who took the external assessment. When we can see the full picture of performance, our experts are then able to decide where best to place the grade boundaries – this means that they decide what the lowest possible mark is for a particular grade.

When our experts set the grade boundaries, they make sure that learners receive grades which reflect their ability. Awarding grade boundaries is conducted to ensure learners achieve the grade they deserve to achieve, irrespective of variation in the external assessment.

Variations in external assessments

Each external assessment we set asks different questions and may assess different parts of the unit content outlined in the specification. It would be unfair to learners if we set the same grade boundaries for each assessment, because then it would not take accessibility into account.

Grade boundaries for this, and all other papers, are on the website via this link:

<http://qualifications.pearson.com/en/support/support-topics/results-certification/grade-boundaries.html>

Awarding BTEC qualifications in 2022

Ofqual has [set out their plans](#) for awarding qualifications in 2022 and intend to return to a normal, pre-pandemic, approach to grading standards over by 2023. They have confirmed that 2022 will be a transition year, to reflect that we are in a pandemic recovery period and students' education has been disrupted.

Our guiding principle and approach to awarding BTEC qualification results in 2022 will be to ensure parity in relation to the approach being taken for GCSE and A level learners. BTEC courses have a different structure and design to academic qualifications - BTECs are modular qualifications (with assessments taking place throughout the course) compared to GCSEs and A levels which are linear (assessed and awarded at the same time at the end of the year), and therefore our approach needs to be different.

In 2022 we will return to the usual method of calculating BTEC qualification results, however adaptations including, U-TAGs and reduced internal assessment, are in place to provide a comprehensive package of support for students.

The basis of our awarding approach to BTECs this year is to ensure it is as fair as possible for all learners. We will use a range of evidence to set grade boundaries for the external units. Part of this evidence will be to closely monitor learner performance in all assessments that contribute to learners' final qualification grade, to ensure parity with A level and GCSEs.

Further information can be found [on our website](#) and via our Social Media channels.

Unit 7: Contemporary Issues in Science

Grade	Unclassified	Level 3			
		N	P	M	D
Boundary Mark	0	8	16	25	35

Introduction

31629_H0, Unit 7, Contemporary Issues in Science, transcends the three science disciplines within Applied Science.

This unit is designed to enable learners to develop their skills and understanding in evaluating the impact of contemporary science issues in our society and how they are discussed in publications.

The assessment outcomes are:

- AO1 Demonstrate knowledge and understanding of the issue
- AO2 Apply knowledge and understanding of the issue to real life scientific scenarios
- AO3 Make valid judgements based on interpretation, analysis and evaluation of scientific information and their sources
- AO4 Apply and synthesise scientific ideas from several sources

This was the sixth series of the specification. Previous issues have included antibiotic resistance, nanotechnology in space travel, genetically modified crops, health effects of diesel, plastic pollution and for this January 2022 examination wave and tidal wave power as a means of generating energy.

The question paper followed the same format as for the previous series and for the sample assessment material. It consisted of five questions, three of which require longer responses (two carrying 12 marks and one carrying 15 marks) and the other two require shorter responses (carrying 5 or 6 marks).

Learners are given access to the stimulus material before the examination and are expected to spend six hours of study time in analysing the content of the articles and carrying out any further research that they deem appropriate.

As detailed in the specification, learners should be looking at the environmental, ethical and moral, social, political and/or financial impacts of the issue, as well as potential benefits, disadvantages and risks associated with the issue.

Learners should develop critical thinking skills and be able to assess the reliability and validity of conclusions reached in one of the articles, sometimes by also assessing the reliability of the source. Learners should also be able to evaluate qualitative and quantitative evidence in the article, to justify their judgments.

The source material for the examination in this series Unit 7 paper were three edited articles; one from The Guardian newspaper, one from the Institute of Mechanical Engineers and one from an article published in Renewable and Sustainable Energy Reviews, by Andreas Uihlein and Davide Magagna.

All five questions in this paper are marked using a levels-based mark scheme. The indicative content in the mark scheme is for general guidance; learners are not expected to cover all of that content in their responses and learners are also credited for other valid responses that they include.

Introduction to the Overall Performance of the Unit

Many learners were well prepared for the examination; this was particularly true for Q1, Q2 and Q5 and, in some cases, less so for Q3 and Q4. Some learners obviously use their preparation time very well.

Most responses were clear and coherent, the learners' lines of argument were able to be followed.

Performance across the cohort was very similar to previous series with issues of time management across the five questions being a factor in individual learner performance. It was evident that some learners ran out of time towards the end of the paper, having spent a great deal of time on a detailed answer to Q1 and Q2, and leaving little time for the remaining questions.

Individual Questions

Question 1 (12 marks)

The question asked learners to discuss the implications of the scientific issue: tidal energy as a renewable energy resource and the advantages and disadvantages from developing such a means of generating electricity.

Learners were expected to discuss the ethical, moral, social environmental and economic implications of developing and then deploying tidal generators in the waters around the United Kingdom and elsewhere in the world. As indicated this question was the best answered by most learners.

Good responses demonstrated that learners could select information relevant to their answer from across the three articles and that ethical, moral, social environmental and economic implications were discussed with the links between them identified. Good answers were well developed and had a clear structure.

Many learners adopted an article by article approach, or an implication by implication approach and did not draw links between the implications as a result. This allowed the learners to demonstrate skills in AO1 and AO2 but not in AO3 and AO4.

Learners were not always clear that they understood what a moral issue was as compared to an ethical issue, or indeed a social issue. Less able learners often mixed these up and gave responses that could be considered as attempts to draw links rather than drawing links between the various implications. Centres would greatly help their learners by giving examples of what these terms meant so that they would then be used in an appropriate way in answering the question.

It was evident that some learners had not really engaged with the articles by starting an answer relating to tidal generators and the switching to wind generators or even solar power generators and devoting a good deal of the answer to aspects of renewables that were not dealt with in the articles. The question clearly states that answers should relate to the articles and not drift into other areas of renewable

energy. Again, centres would help learners by making clear the need to stick to the articles and to the point rather than embark on unqualified discussions of other ways of generating renewable energy.

Some learners devoted much of their answers to environmental concerns, which was fine up to a point, as environmental implications do impact significantly on the topic in the articles. Some learners devoted their entire answer to dealing with environmental aspects to the exclusion of the other implications and thereby reduce the standard of the answer. A range of implications needed to be considered to achieve a high band mark.

This response achieved Band 4 at 12 marks

1 Discuss the implications of the scientific issue identified in the articles.

(12)

In article 1, there are many implications seen. A social implication that can be inferred from this article is that if the government do decide to go ahead with this tidal power project then jobs can open up for local people specialised in that sector. With jobs opening up, the employees can provide for themselves and their family. This is a good impact and advantage as it decreases the chance of the employee and their family to economically struggle. This social impact links with this economic impact as the employee finds a job, whilst managing to make income.

However another social impact could be that by installing tidal power turbines, there is a higher chance that views of the seascape and landscape could become spoiled. With these sights becoming spoiled, they will unattract guests which will lead to a decrease in tourism. Not only is this socially bad for the local area, it is economically bad too. A decrease in tourism and guests means less people will pay to visit the areas where the construction of the tidal power turbines will be built. Therefore this social impact will

lead on to have a negative economic impact for the local area. On top of this if the government still decide to go ahead with the idea it 'requires large levels of investment' the Energy Technologies Institute (ETI) said, making it ~~a~~ vital ~~decide~~ that the government makes the right decision, otherwise the government could end up broke due to the many reasons mentioned above.

Environmentally it 'generates clean electricity' so wildlife such as birds won't be affected as much. ~~However~~ Considering no harmful gases are emitted, local fishing zones could be affected and the plants could lead to more coastal erosion.

Ethically, there is a huge risk that sea life will be affected because the devices are anchored to the bottom of the seabed which will destroy ~~mean~~ marine life and can potentially cause death, which ethically and morally is wrong. This ~~Not only this, but other ecosystems can be~~ is also mentioned in article 5 where there is a morality of fish passing through turbines (blade strike) and the collision risk of marine mammals with tidal stream farms. This could also affect other ecosystems

some viewers may argue ~~and scholars~~.

In Article 2, there seems to be more negative impacts as the article is leaning away from the idea.

By leaning away from this opportunity 'as it swims against tidal energy' it reduces the chances of jobs being opened up in this sector. 'Tidal energy cannot yet compete with the roughly £100/MWh cost of offshore wind, which proves that it is economically unstable and socially too.'

If this operation goes ahead which is likely not to happen according to this article, they might be 'installing turbine nacelles that might weigh more than 100 tonnes.' This is environmentally negative as it is 'no easy task, requiring huge marine construction ~~rather~~ vehicles.' This could potentially affect marine life ~~some viewers~~ and some viewers may argue that it is ethically wrong too.

The workers will be seen to working under challenging conditions due to the ~~environment~~ as ~~'that~~ weather ~~is~~ as 'That environment is one of the most challenging in which

engineers operate. Most viewers will argue that this is ethically bad because as it is their job they don't have an option ~~to~~ not to do it. Working in these challenging environmental conditions means ~~that~~ they could catch illnesses, which isn't just ethically bad, it is socially bad as they could pass it on.

Lead Examiner comment: *The learner has demonstrated comprehensive knowledge and understanding of the scientific issues and has drawn upon relevant implications and the links between them. The discussion is well developed and is coherent and logical. The answers is not perfect, and it needs to be clear to both centres and learners that this piece of work exemplifies a good Band 4 response despite some comments at the end of the answer that are not particularly relevant.*

This response achieved Band 1 at 3 marks

1 Discuss the implications of the scientific issue identified in the articles.

(12)

The uk wants to use clean electricity however for that to occur it may also increase the chance of global warming due to the production of technology which can release CO_2 emissions as well as an increase in cost as money will be needed for production of technologies and transportation.

Ethical impacts

Using wave power devices can affect the ecosystem as it can damage the environment as well as kill the organism in that ecosystem.

* Another ethical issue is that clean energy by wave power would be only be accessed by rich countries which can put the poor or middle class countries at risk.

* Health risks due to air pollution and CO_2 emission.

Social impacts

* If technologies transform wave power to electricity it can cause people to run out of jobs from countries that work on fossil ~~fuel~~ ^{fuel}.

* However new jobs can be created but it will be limited for only the people who know how ~~the~~ ^{to} operate machine.

* If technologies work and generate clean energy it can decrease air pollution due to the stop of CO_2 (carbon dioxide) emission.

Economic ~~agent~~ impacts

* If clean power is achieved it would be profitable for Britain.

* However energy storage would be expensive to build.

* It would be expensive for transportation.

* It would be expensive to ^{capture} create power.

Environment impacts

* production of clean power can cause less CO₂ emission.

* If the possibility of clean power is successful it can decrease air pollution.

* As engineers operate at the depths of 30-40m, it can lead to seismic activity as it can cause earthquake.

Lead Examiner comment: *The learner has limited knowledge of the topic. With limited attempts to draw links, however there is some structure and coherence particularly towards the end of the answer which allows a mark at the top of Level 1 to be awarded. Overall, the answer is generic, with unsubstantiated comments in the bullet points which have not been developed. It should be noted that a bullet point format is perfectly acceptable, however it is also necessary to show links between issues for higher bands.*

Question 2 (6 marks)

Learners were asked to identify some of the different organisations and/or individuals mentioned in the articles and to suggest how these may have an influence on the scientific issue.

The indicative content in the mark scheme gave a wide range of different organisations and individuals. Despite this many learners went for the first names seen in the articles be they an organisation or individual and then went no further. The articles gave arguments for and against the issue and those learners that went for the first names may well not have had much of a balance on the way the organisation or individual influenced the issue. Good answers gave a wider range of both organisations and individuals and were able to explain the influence they had on the issue. They were able to link with and support their reasoning with information from the articles. Many learners however simply listed the individuals and organisations or describe what they did rather than what influence they have.

This response achieved Band 3 at 6 marks

- 2 Identify the different organisations/individuals mentioned in the articles and suggest how they may have an influence on the scientific issue.

(6)

In the Article one is mentioned that The ETI is funded by government and companies including Rolls-Royce, EDF and BP, called for a "radical rethink" of the technology is to provide affordable renewable electricity. They are suggesting that the aggressive cut in the costs of wave energy will not help the innovations to meet their criteria. This is the negative influence on the scientific issue because big companies like this should work more on their strategies that how the renewable energy can be affordable.

Bristow said "We think it's a shame, because ultimately it's a no brainer: it's clean, it's green, it has potential to be very cost effective". Here he is suggesting that we are confident in our technology but we are not in UK's government. He highlighted some points which have a positive influence on the scientific issues if ~~there~~ they are considered by the government.

In the title two Andrew Scott said who is chief executive at Orbital Marine power that it was "a new benchmark for the tidal industry" which is a positive influence as it will encourage

to put in some more effort on this project. As it is mentioned that it is UK-built floating generator with two 1MW turbines and how they have worked on on the operation with fibre-optic cables, wifi, radio and 4G signals allowing managers to take over using a smart phone application if needed is a positive and a good influence on scientific issues as it is suggesting that after facing problems still they managed to come back and took project quite far.

In Article three it is mentioned about the German Federal Maritime and Hydrographic Agency of which provides the current prediction up to 3 days for the weather forecasts. Which is very helpful and has a positive influence on the scientific issues as using it before installation of wave power & would be helpful and can prevent ~~some~~ ~~only~~ the project from loss.

Lead Examiner comment: The learner has selected organisations and individuals that have had an influence on the research development, or construction of tidal generators. The answer gives an explanation of how these may influence the issue.

This response achieved Band 1 at 2 marks

- 2 Identify the different organisations/individuals mentioned in the articles and suggest how they may have an influence on the scientific issue.

(6)

In article one the organisation Energy technology institute (ETI), are the group that want to impliment the tidal power machine. This group had an effect on the issue because they are the ones that wanted the goverment to agree on the idea so they can get the money for it and this is what was causing the economic issue.

In article two Andrew Scott who was the chief executive at Orbital marine power. Said that "the most recognisable technology is the horizontal axis turbine that is nearly identical to the off shore wind turbine but smaller." This would give the people who are making the machine more hope but it may also make the goverment feel as if they are doing the right thing by funding for this machine.

In article three German federal Maritime and hydrographic agency provides predictions for up to three days

Lead Examiner comment: The response identifies two organisations and an individual. This indicates adequate knowledge. The explanations are basic and a little confused, with general statements. There is little to suggest what influence each has on the issue.

Question 3 (12 marks)

This question asks learners to discuss whether Article 3 has made valid judgements about the development and construction of tidal generators as a means of generating electricity.

This question remains the least well answered in the paper. Many learners restricted their answers to general comments about references, peer review, reliability of the source(s) of the article and the authenticity of the data. Some learners considered the other articles which are not relevant in this question, although it is relevant to cite evidence in the other articles that supports or does not support the conclusions made in Article 3. Some responses appeared not to be planned and, in some cases, the poor synthesis and use of language made it difficult to follow the lines of argument.

Despite there being a clear section at the end of Article 3 which summarised and drew conclusions based on the evidence presented, many learners do not identify exactly what conclusions and judgements had been drawn. Some learners did correctly identify some of the judgements and conclusions and then address them in terms of quality of data to support them. These learners were able to achieve higher band marks. Learners were led to the conclusion that future research should be focused on developing large scale arrays of tidal generators to capture the energy of the flow of water in the oceans. They may have gone on to show that there are both economic and environmental issues associated with the capture of this energy.

The validity and reliability of these conclusions can be assessed in the light of the fact that the article reviews a lot of research by various organisations and research teams and many studies have reached the same conclusions. Many learners pointed out that there were many references to support their view on the reliability of the data. Some suggested that there were 101 references in the edited article, which was not the case as many were edited out.

This response achieved Band 4 12 marks

3 Discuss whether Article 3 has made valid judgements.

In your answer you should consider:

- how the article has interpreted and analysed the scientific information to support the conclusions/judgements being made
- the validity and reliability of the data
- references to other sources of information.

(12)

Article 3 was written by Andreas Vihleln and Davide Magagna. It was published in renewable and sustainable Energy reviews in 2016. The article aimed to provide an overview of the current state of research in wave and tidal current energy. The article ~~as~~ focuses on the research beyond technology or technological improvements and identify areas where research gaps exist and where future research effort should be directed.

The outcome of this article explains that future research and innovation in technology is required to tap the full potential of ocean energy.

The article concludes that it has reviewed the state of research in ocean energy focusing on wave and tidal current. It has not focused on improvement to ocean energy technology and identified areas where research efforts should be directed to.

It also concludes that modelling approaches for resource assessments and forecasting should be further widened to accommodate conflicting use of the marine environment and technical limitation such as grid connection. It states there is missing life cycle assessments on areas such as fluctuation of power output, storage and grid integration.

Validity is the quality of being logically or factually sound. The article shows ~~to~~ validity as the references used are relatively new with dates in the last decade meaning the data and information could be still up to date or changed slightly. The reference dates range from 2002 - 2014. The references are separate individuals and organisations which include different focuses and research of ocean energy ranging from studies produced to investigations on devices and implantations. It is valid as it has^a well displayed structure with clear sections that show focus of the information in the sections. The introduction explains the aims

and focus of the article. Every section of information follows a paragraph on the future ~~the~~ research needed for the impacts and issues stated by the article. For example, the section headed 'costs and social impacts' ~~and~~ states the issues with ocean energy the explains what areas need to be researched on. The people included in the article are professionals and government / privately funded organisations. This shows validity as these organisations and people have produced research from primary findings and data developed by their investigations. The article uses ~~the~~ technology and information that is new and is a future project meaning the research is limited due to ~~how~~ a small amount of years it has been in use and been improved.

~~The article shows~~ Reliability is the quality of showing correct and useful information. The article shows reliability as it contains multiple sources that are used for many statements in the article. ~~The environmental investigation included~~

is reliable as it sources from experts who have developed professional and accurate research. The article produces an unbiased view of the energy source with both good and bad points such as the possible impact on the environment. However, ~~the~~ the article is unable to actualise and provide more information on the points made due to the lack of research made. This makes the points unreliable as further research could show them to be incorrect or different in the future. The article contains 101 references but the article is not as reliable from the removal of references as it has been altered for clarity.

Overall the article is valid and reliable from its use of many references which are professional or investigations held by large research organisations that are dated back less than a decade before the publication date. The article ^{gives} ~~gives~~ an unbiased view from its analysis of both advantages and disadvantages of ocean energy. The article itself is still online.

(Total for Question 3 = 12 marks)

Lead Examiner comment: The answer is a comprehensive response that draws on material from all aspects of Article 3. The learner recognises the reliability and validity of the science involved. The learner consistently supports their statements using the article and there is a clear well-developed structure which is logical.

This response achieved Band 1 at 3 marks

3 Discuss whether Article 3 has made valid judgements.

In your answer you should consider:

- how the article has interpreted and analysed the scientific information to support the conclusions/judgements being made
- the validity and reliability of the data
- references to other sources of information.

(12)

Validity is defined as whether the data ~~is~~ that is shown is true or not. Reliability ~~is~~ of data is shown when a large group of people have stated it.

In article 3, there are no statistics such as graphs or tables to support the judgements that have been stated, which may question the validity. However, it includes a sub-heading regarding future research.

The article has shown a general overview of research of tidal/wave energy in its current state, which shows they have a good and clear understanding on what they need ~~to~~ to work and improve on.

In regards to references, about 101 have been produced, which shows the reliability of the data is good due to

the same people of producing a reference at different period of times. Old data is seen a lot and the most recent is 2014 which shows the validity of data is good due to the researches being conducted in the early stages.

In the article, there are also paragraphs and subheadings to show how data is organised, and there is a clear structure which makes it easier for the audience to read it.

Lead Examiner comment: *The main focus of the answer is the style of the article. Reference is made to judgements, but these are not supported by any scientific information. The learner has mentioned that the article gives a general overview, but this is not developed. Overall, the learner's statements are superficial and vague with limited points made. There is some structure which places the answer at the top end of Band 1.*

Question 4 (5 marks)

This question asks learners to suggest any potential areas for further development and/or research of the issue.

A vague long list of areas for development and research will not score highly but a shorter list integrating relevant knowledge and ideas of how this further development would be of use will obtain a higher score.

Many learners made vague recommendations for areas of further research and development but did not elaborate on them. For example, many said that research should be undertaken to improve the maintenance of the generators, or in protecting marine life, however there was no real suggestion as to the research and development needed to provide ecologically sound alternatives for marine life or what research would be needed to develop parts for turbines that needed less maintenance. A number of learners omitted to answer this question, this may have been as a result of a lack of time and a need to concentrate on the longer more mark bearing questions or simply that learners were not really clear as to what research or development in this area of renewable energy could be undertaken.

This response achieved Band 3 at 5 marks

4 Suggest potential areas for further development and/or research of the scientific issue from the three articles.

(5)

There are many technologies in development for energy produced by tidal waves which show the huge potential of this source of energy. The article also suggests further research in areas such as power output and storage, cost reduction could be made due to increased absorbed energy. There are plenty of areas that need further development and research mentioned in the three articles. The main area for further development is the cost of this technology. This issue has been talked about across all three articles.

Wave power devices are 10 times more expensive than other sources of low carbon power and need a radical rethinking. Another issue that needs to be researched more is how this technology will affect the environment. This issue has been mentioned in the third article. Governments and society need a understanding of the environmental implications of ocean energy systems before ocean energy deployment takes place. Future research in the area of the environmental impacts should be focused on localised environmental impacts including electro-magnetic field effects of subsea cables, flow alteration, sedimentation and habitat change of near generation devices. A new range of technologies, devices and sub-systems need in-depth analysis. Many researchers look at the economics of ocean energy, including forecasts for future expenses. Skill improvements are required, particularly in terms of operating and maintenance expenses. Cost-benefit assessment that consider grid integration, energy security, and ecological services are clearly lacking. When it comes to social implications other than job creation, such as welfare, nothing is known. Studies on the consequences on the national and EU levels, as well as coastal towns, are particularly

essential. Another issue mentioned in the third article states that there is currently no single European standard grid code. Rather, the ocean energy industry, like all other energy companies, must adhere to the national grid codes. Appropriate control systems for the ocean energy converters and arrays, on the other hand, must be created. More study into control techniques is needed since it has the ability to reduce costs by increasing absorbed energy while still fulfilling grid code requirements.

Lead Examiner comment: The learner has given a wide-ranging description of areas for development, and these are supported by reference to the articles. The learner has synthesised the relevant knowledge from the article to help make a good response.

This response achieved Band 2 at 2 marks

- 4 Suggest potential areas for further development and/or research of the scientific issue from the three articles.

(5)

The first area the articles could improve on is the environmental impact. All the articles mention how bad it is for the seabed and the possibilities of marine life getting caught up in the machines, so they should research how to better this.

They should also carry out more investigations ~~to~~ with real machines, not models, so they can obtain more raw data to back up points made in the articles about power supplies, and marine life/impact.

They should mention more ~~at~~ to do with funding and ^{find out} ~~say~~ where more funding is ~~at~~ needed and where the most funding is going. This may help them decrease costs and use more funds to upgrade machines.

They should do more research into efficiency as the way of installing the machines and uninstalling ~~machines~~ machines is a very long process and ~~isn't~~ very while also ~~being~~ being very damaging to the environment.

they should research into how to lower the maintenance costs as it doesn't explain why they cost as much as they do and if they reduced them, they would have more money to put into the machines and upgrades.

Lead Examiner comment: *Much of the focus in the answer is superficial, however some basic suggestions are given with generic solutions offered which relate to doing things better or spending more on the various projects. The lower end of Band 2 was given to this response.*

Question 5 (15 marks)

In this question learners were asked to consider themselves as working for a general news website. In that role they were to write an article about the UK government's tidal renewable energy policy.

Learners were told to use information from all three articles and to consider the audience, what they wanted readers to learn from the article and consider the advantages and disadvantages of tidal power in terms of a means of generating electricity as part of UK government plans.

As this article was for a web-based news platform, which in effect is the equivalent to a newspaper. Many learners did come up with catchy and relevant headlines to start their article. The article was for a general news channel, so it was not to be too scientific nor too sensationalised and lacking content. The article needed to be supported from information that had been found in the material learners were sent in advance and not based on unqualified personal opinion. The article should have been stand alone, without references to Articles 1, 2 and 3, which less able learners tended to refer to. The response was not meant to be an essay which returned to the issues that were considered in Article 1. The article was to be coherent and logical and structured so that some advantages and disadvantages of tidal renewable energy were discussed, and a conclusion reached. Scientific evidence was expected to inform the article and any terminology used should be explained as many in the audience will not be very scientifically literate, but neither should they be patronised.

Some learners developed articles that only looked at advantages or disadvantages or did not write a conclusion on the basis of the material presented.

This response achieved Band 4 at 15 marks

5 You are a researcher working for a general ^{public} news website.

The website wants to produce an article about the UK Government's tidal renewable energy policy.

Your task is to write an article that evaluates the advantages and disadvantages of possible tidal power projects to generate electricity.

Use information from the three articles provided for this task.

When writing your article, you should consider:

- who is likely to read the article
- what you would like the reader to learn from the article.

(15)

TIDAL ENERGY CREATES A WAVE IN THE INDUSTRY

Recently, the UK government have renewed their tidal ~~renewable~~ renewable energy policy.
So, what is Tidal energy?

In a nutshell Tidal energy is the act of harnessing the ocean's waves to generate clean energy. Essentially they would work like wind turbines but with water instead of wind. It is still a relatively new idea, but a lot of companies are attempting to develop it.

There are ~~very~~ very divided views about tidal energy due to its extensive list of advantages AND disadvantages.

Advantages like;

IMPROVING THE ECONOMY BY CREATING MORE JOBS

- 10,500 - 26,500 could be permanent
- They would be high quality
- Poorer areas could see an ~~increase~~ ~~in~~ employer rise
- A wide range of qualifications and skillsets would be required making a lot of jobs easily accessible

POSSIBLE HABITAT CREATION FOR MARINE BIRDS

- If the tidal machines have the correct architecture, homes could be made for many precious and possibly endangered animals.

GLOBAL COOPERATION

- ~~due~~ due to the scale of projects its possible that countries will work together in order to achieve the common goal
- Improving country relations is vital and this would be a way to start.

However, there are always two sides to every coin.

Disadvantages could include;

~~The~~ The progress COULD be very slow

- It takes years of ~~the~~ ~~start~~ testing, designing and creating for an idea to be ~~implemented~~ implemented especially due to the huge impact it could have
- The government is still relatively hesitant to fully support ~~the~~ this new way of creating energy.

~~THE~~ EXPENSIVE

- An estimate 1.3 billion price tag has been put onto ^{tidal} renewable ~~and~~ energy. ~~THE~~ So although private investors and funding could help, a lot of that could be taxpayer money
- Due to the amount, the government has also ~~been~~ been hesitant to speed up progress.

ENVIRONMENTAL DAMAGE

- ^{Contrasting} ~~Despite~~ ~~in~~ the previous part of this article, there could be quite a few issues that ^{could} occur

from installing tidal energy machines.

- habitats could be ruined
- water flow patterns disrupted
- Chemical levels increased + risk of chemicals being released.
- Mortality of some fish & sea mammal species.

After listing an equal amount of advantages and disadvantages, tidal energy could still be the next step to making the world more carbon neutral. More research into marine life, ~~was~~ getting the public on board and a bit of patience could result in a brand new efficient way of creating energy.

I implore you to do your own research and come up with your own informed decision after reading this article that touches the surface of the possibilities for ~~the~~ renewable tidal energy.

(Total for Question 5 = 15 marks)

Lead Examiner comment: *The learner has written an article that has good audience awareness, with a good introduction and a conclusion that asks the reader to consider their position on the article. There is very good use of scientific information based on the articles and it is in a readable form. The use of short paragraphs, bullet points and subheadings make the article accessible and keeps the reader engaged. Overall, the learner has summarised and synthesised the main points and used supporting and conflicting statements. The tone and style are effective and the terminology used is appropriate. The structure is well developed, clear, coherent, and logical.*

It could be argued that the learner has missed this point or that point in their article, or they could have covered an aspect in more detail. To gain full marks we are not expecting a perfect answer. This response indicates better than borderline full marks. It is a very good attempt.

This response achieved Band 2 at 6 marks

5 You are a researcher working for a general news website.

The website wants to produce an article about the UK Government's tidal renewable energy policy.

Your task is to write an article that evaluates the advantages and disadvantages of possible tidal power projects to generate electricity.

Use information from the three articles provided for this task.

When writing your article, you should consider:

- who is likely to read the article
- what you would like the reader to learn from the article.

(15)

Tidal Power, is it worth it?

There are many great advantages of tidal energy that include:

- Clean and pollution free energy, tidal energy uses energy from tidal waves to create power, this means no pollution is created.
- The technology is already here, Beta versions of the technology needed are already available.
- It could create hundreds of new jobs for people

There are also many disadvantages of tidal energy:

- The tech is hard to make and the cost to maintain it is too high.
- The efficiency of the tech currently isn't commercially viable.
- It's such a new technology that the impacts environmentally can only be guessed.

In conclusion, due to the evidence presented it seems clear that tidal power has the potential to be something huge, but only if it's carefully monitored.

Lead Examiner comment: The learner has not given much in the way of detail in the answer. There are advantages and disadvantages, but the brief points that are made have not been expanded upon. The article is in a readable form, with short sections and bullet points appropriate to this type of article, it helps to pull the response to a higher mark. Overall, the learner has summarised some points with supporting and conflicting statements, they have shown an awareness of purpose, with an appropriate tone and style and the article is structured.

This response achieved Band 1 at 1 mark

5 You are a researcher working for a general news website.

The website wants to produce an article about the UK Government's tidal renewable energy policy.

Your task is to write an article that evaluates the advantages and disadvantages of possible tidal power projects to generate electricity.

Use information from the three articles provided for this task.

When writing your article, you should consider:

- who is likely to read the article
- what you would like the reader to learn from the article.

(15)

Currently technology is in the beginning of development, however numerous projects have been worked on over the years, such as the O₂ Orbital. The O₂ orbital has created a bench mark for tidal industry. The SR2000 has provided 3GWH more than the whole of the Scottish Tidal power.

Lead Examiner comment: *The learner has misjudged the tone and audience, there is a lack of evidence from the articles, however it is an attempt at using information to generate an article. Overall, the response has little to link it with the articles that learners were given, there is no awareness of the audience and the response is unstructured.*

Summary

It has become increasingly evident is that some learners appear not to be using the preparation time prior to the examination effectively. This time is allocated to allow learners to read the articles carefully, undertake their own research and follow up references given in the articles that may lead the learner to look at all aspects of the issue in question.

The question by question summary identifies points that may help learners and is drawn largely from advice given in previous series which clearly shows what learners must do in order to produce good answers in this examination. This advice remains as valid for this series as in previous series.

Question 1:

- Learners should clearly establish the scientific issue/issues before examining evidence from the articles for the implication areas.
- Responses that simply take an article-by-article or implication-by-implication approach are unlikely to show links to and between implication areas.
- The question requires a discussion so positives and negatives must be drawn out.
- Learners must be careful to proportionate their time so that they do not spend too long on this question.
- Learners must read and then reread the three articles provided before attempting an answer to ensure that they understand what the articles are about.

Question 2:

- Learners must provide more depth than simply provide a list of organisations/individuals mentioned in the articles and should investigate who they are and what they represent as part of their preparation for this examination.
- Responses need to consider how wide and deep the organisation or individual's sphere of influence is in respect of the scientific issue, this may be evident from the article, but further research may also be needed.
- Consideration of a range of different organisations or individuals will allow learners to discuss different viewpoints and motivations.

Question 3:

- The key focus of this question is the validity of the judgements being made by the article, so learners must identify what the conclusions are and whether these are justified and supported.
- Whilst learners need to be clear about validity and reliability, they must be taught to be able to recognise and articulate the evidence for this from within the article.
- The question requires a discussion so positives and negatives must be drawn out.
- Learners should try to avoid reliance on generic statements such as the number and currency of references.
- The question is only about Article 3 so responses should be restricted to that article but may draw on other articles if aspects are relevant to the points being made in Article 3.

Question 4:

- Identification of areas for further research or development within articles is a good starting point, but learners must be able to extrapolate from this with their own suggestions and ideas.
- Whilst there should be reference and identification of areas from the articles, learners should undertake their own wider research to integrate with what they have learnt from the articles.
- Learners should take more steps to understand and research the science underpinning the articles rather than reliance on socio-economic developments.

Question 5:

- Learners need to respond to the format of the evidence required by the question, in this case an article which would be structured in parts such as introduction / background, discussion and conclusion.
- Responses need to consider their target audience. Some key considerations are who is the audience, what is relevant to the audience, what is the level of understanding of the issue, what should be the tone they should be addressed in, and should the evidence be advising or informing.
- Learners should bear in mind to give both sides of an argument within a discussion, not just advantages or disadvantages for an issue.
- Learners must be careful to proportionate their time so that they have sufficient time on this question, which is almost one-third of the marks available.



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